



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,656	03/29/2004	Jiaw-Ren Shih	67,200-1263	2449

7590 05/26/2006
TUNG & ASSOCIATES
Suite 120
838 W. Long Lake Road
Bloomfield Hills, MI 48302

EXAMINER

ARORA, AJAY

ART UNIT PAPER NUMBER

2811

DATE MAILED: 05/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,656

Applicant(s)

SHIH ET AL.

Examiner

Ajay K. Arora

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/5/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 15-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 3/29/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

Applicant's election of Group 1, Claims 1-14, drawn to an electronic device in the reply filed on 5/5/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Therefore, the restriction is made final.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 8 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Bissey (US 6,054,754), hereinafter Bissey.

Regarding Claim 1, Bissey (refer to Figure 1) teaches an integrated circuit (12) comprising: a primary substrate having a top surface (16), a bottom surface (36), and a plurality of side surfaces; a plurality of contacts (14) on the top surface (16) of the

Art Unit: 2811

primary substrate connectable to pins (28 or 30) of a packaging element (20); and, a capacitive coating (32) on at least the bottom surface (36) of the primary substrate to make contact with a lead frame (22A) intended to secure the primary substrate to the packaging element.

Regarding Claim 8, Bissey (refer to Figure 1) teaches an electronic device comprising: a packaging element (20) having a number of pins (28 or 30) to externally connect the electronic device; an integrated circuit (12) having a top surface (16), a bottom surface (36), and a plurality of side surfaces; a plurality of contacts (14) on the top surface (16) of the IC (12) and connected to the pins (28 or 30) of the packaging element (20); a capacitive coating (32) on at least the bottom surface (36) of the IC (12); and, a lead frame (22A) to secure the IC to the packaging element, the capacitive coating (32) sandwiched between the IC (12) and the lead frame (22A).

Regarding claim 4 and 11, Bissey teaches that the capacitive coating (32) is a capacitive dielectric (Col. 3, lines 50-55).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, 5-7, 9, 10 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bissey.

Regarding Claims 2 and 9, Bissey teaches substantially the claimed structure, but does not specifically state that the capacitive coating (32) has a capacitance that is "lower than an internal capacitance of the IC". However, Bissey teaches that the parameters controlling capacitance may be modified to suit a specific application (Col. 5, lines 23-32 and lines 64-67). It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the device of Bissey such that the capacitive coating (32) has a capacitance that is lower than an internal capacitance of the IC. The ordinary artisan would have been motivated to modify Bissey for at least the purpose of achieving a lower effective capacitance (when two capacitors are connected in series, the resulting effective capacitance is lower than capacitance of either of the capacitors).

Regarding Claims 3 and 10, Bissey teaches substantially the claimed structure, but does not specifically state that the capacitive coating extends from the bottom surface "to the plurality of side surfaces" of the primary substrate/IC. It is well known in the art that the capacitance of a parallel plate capacitor is governed by the formula:

$$C = \epsilon_0 \epsilon_r \frac{A}{d}$$

where

Art Unit: 2811

C is the capacitance in in farads, F

ϵ_0 is the permittivity of free space, measured in farads per meter

ϵ_r is the dielectric constant or relative permittivity of the insulator used

A is the area of each plane electrode, measured in square metres

d is the separation between the electrodes (or thickness of dielectric between the capacitor plates), measured in meters

It is clear from the above formula that capacitance is substantially independent of any dielectric that extends outside the area (A in above formula) to the side surfaces of the substrate/IC; i.e. the claimed device would have capacitance substantially the same as the device where dielectric does not extend to the side surfaces (also acknowledged in applicant's specification). Therefore, it would have been obvious to one of ordinary skills in the art at the time of the invention to modify the device of Bissey so as to allow the capacitive coating extending from the bottom surface to the plurality of side surfaces of the primary substrate/IC. The ordinary artisan would have been motivated to modify Bissey for at least the purpose of achieving cost savings resulting from not having to reject parts if capacitive coating inadvertently extends to the side surfaces.

Regarding Claims 5 and 12, Bissey teaches substantially the claimed structure, but does not specifically state that the capacitive dielectric has "a low k value". However, Bissey teaches that the k value (i.e. dielectric constant value) of the dielectric may vary widely and may be tailored to suit particular requirements (Col. 5, lines 29-32). Since applicant had completely failed to disclose the composition or material of the capacitive coating, the above teaching encompasses all well known dielectrics and corresponding k values – high, low or anything therebetween. It would have been obvious to one of

Art Unit: 2811

ordinary skills in the art at the time of the invention to modify the device of Bissey such that the capacitive dielectric has "a low k value". The ordinary artisan would have been motivated to modify Bissey for at least the purpose of achieving a low capacitance for a given thickness of the dielectric, since capacitance is directly proportional to dielectric constant (referred to as "k value" in claims) of the dielectric.

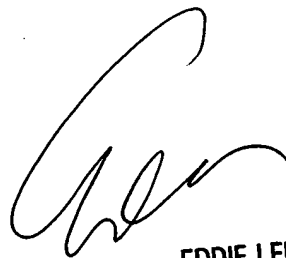
Regarding Claims 6, 7, 13 and 14, Bissey teaches substantially the claimed structure, but does not specifically state that the capacitive coating has a thickness of "between 0.01 millimeters and 1.0 millimeters" (for claims 6 and 13), or "substantially 0.1 millimeters" (for claims 7 and 14). As shown in the above stated formula for capacitance, C , the capacitive coating thickness (d in the above formula) is merely a design parameter. It would have been obvious to one of ordinary skills in the art at the time of the invention to modify the device of Bissey such that the capacitive coating has a thickness of "between 0.01 millimeters and 1.0 millimeters" (for claims 6 and 13), or "substantially 0.1 millimeters" (for claims 7 and 14). The ordinary artisan would have been motivated to modify Bissey for at least the purpose of achieving a specific value of capacitance, as determined by the above formula.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ajay K. Arora whose telephone number is (571) 272-8347. The examiner can normally be reached on Mon through Fri, 8am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800